

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (Canceled)

2. (Currently Amended) The A method for recording data in an a write-once type optical recording medium including a substrate and at least one recording layer formed on the substrate, in accordance with claim 1 constituted so as to project the method comprising:

determining a pulse train pattern so that a level of a pulse is switched from a level corresponding to a level of a recording power to a level corresponding to a level of a bottom power in accordance with at least one of a length of a first recording mark, a length of a blank region to be formed immediately after formation of the first recording mark and a length of a second recording mark formed subsequent to the formation of the first recording mark;

modulating a power of a laser beam in accordance with the thus determined pulse train pattern;

projecting the laser beam onto the optical recording medium; and  
forming the first recording mark;

wherein a delay time period  $T3$  between a fall time of a data pulse corresponding to the first recording mark and a time at which the level of a pulse is switched from the level corresponding to the level of the recording power to the level corresponding to the level of the bottom power in the pulse train pattern used for forming the first recording mark is set so as to satisfy a formula below, wherein  $T3(x1, y, z)$  is a delay time period  $T3$  in the case of forming the first recording mark having a length  $x1$ , the blank region having a length  $y$  after the formation of the first recording mark and the second recording mark having a length  $z$  and  $T3(x2, y, z)$  is a delay time period  $T3$  in the case of forming the first recording mark having a length  $x2$ , the blank

region having a length  $y$  after the formation of the first recording mark and the second recording mark having a length  $z$ , where  $x1$  is smaller than  $x2$ .

$$T3(x1, y, z) > T3(x2, y, z)$$

3. (Currently Amended) The A method for recording data in an a write-once type optical recording medium in accordance with claim 1 including a substrate and at least one recording layer formed on the substrate, the method comprising:

determining a pulse train pattern so that a level of a pulse is switched from a level corresponding to a level of a recording power to a level corresponding to a level of a bottom power in accordance with at least one of a length of a first recording mark, a length of a blank region to be formed immediately after formation of the first recording mark and a length of a second recording mark formed subsequent to the formation of the first recording mark;

modulating a power of a laser beam in accordance with the thus determined pulse train pattern;

projecting the laser beam onto the optical recording medium; and

forming the first recording mark;

wherein a delay time period  $T3$  between a fall time of a data pulse corresponding to the first recording mark and a time at which the level of a pulse is switched from the level corresponding to the level of the recording power to the level corresponding to the level of the bottom power in the pulse train pattern used for forming the first recording mark is set so as to satisfy a formula below, wherein  $T3(x, y1, z)$  is a delay time period  $T3$  in the case of forming the blank region having a length  $y1$  after the formation of the first recording mark having a length  $x$  and the second recording mark having a length  $z$  and  $T3(x, y2, z)$  is a delay time period  $T3$  in the case of forming the blank region having a length  $y2$  after the formation of the first recording mark having a length  $x$  and the second recording mark having a length  $z$ , where  $y1$  is smaller than  $y2$ .

$$T3(x, y1, z) > T3(x, y2, z)$$

4. (Currently Amended) A method for recording data in an optical recording medium in accordance with ~~claim 2~~ any one of Claims 1 to 3, claim 2, wherein a delay time period T3 between a fall time of a data pulse corresponding to the first recording mark and a time at which the level of a pulse is switched from the level corresponding to the level of the recording power to the level corresponding to the level of the bottom power in the pulse train pattern used for forming the first recording mark is set so as to satisfy a formula below, wherein T3 (x, y<sub>1</sub>, z<sub>1</sub>) is a delay time period T3 in the case of forming the blank region having length y<sub>1</sub> after the formation of the first recording mark having length x and the second recording mark having length z<sub>1</sub> and T3 (x, y<sub>2</sub>, z<sub>2</sub>) is a delay time period T3 in the case of forming the blank region having length y<sub>2</sub> after the formation of the first recording mark having length x and the second recording mark having length z<sub>2</sub>, where y<sub>1</sub>z<sub>1</sub> is smaller than y<sub>2</sub>z<sub>2</sub>.

$$T3(x, y_1, z_1) > T3(x, y_2, z_2)$$

5. (Currently Amended) ~~The A method for recording data in an a write-once type optical recording medium in accordance with claim 1~~ including a substrate and at least one recording layer formed on the substrate, the method comprising:

determining a pulse train pattern so that a level of a pulse is switched from a level corresponding to a level of a recording power to a level corresponding to a level of a bottom power in accordance with at least one of a length of a first recording mark, a length of a blank region to be formed immediately after formation of the first recording mark and a length of a second recording mark formed subsequent to the formation of the first recording mark;

modulating a power of a laser beam in accordance with the thus determined pulse train pattern;

projecting the laser beam onto the optical recording medium; and

forming the first recording mark;

wherein a delay time period T3 between a fall time of a data pulse corresponding to the first recording mark and a time at which the level of a pulse is switched from the level corresponding to the level of the recording power to the level corresponding to the level of the

bottom power in the pulse train pattern used for forming the first recording mark is set so as to satisfy a formula below, wherein  $T3(x, y, z1)$  is a delay time period  $T3$  in the case of forming the blank region having length  $y$  after the formation of the first recording mark having length  $x$  and the second recording mark having length  $z2$  and  $T3(x, y, z2)$  is a delay time period  $T3$  in the case of forming the blank region having length  $y$  after the formation of the first recording mark having length  $x$  and the second recording mark having a length  $z2$ , where  $z1$  is smaller than  $z2$ .

$$T3(x, y, z1) > T3(x, y, z2)$$

6. (Currently Amended) ~~The A~~The method for recording data in an optical recording medium in accordance with ~~claim 2~~claim 12, wherein the time at which the level of the pulse of a delay time period  $T3$  between a fall time of a data pulse corresponding to the first recording mark and a time at which the level of a pulse is switched from the level corresponding to the level of the recording power to the level corresponding to the level of the bottom power in the pulse train pattern used for forming the first recording mark is switched from a level corresponding to the level of the bottom power to a level corresponding to the level of the recording power is determined in accordance with at least one of the length set so as to satisfy a formula below, wherein  $T3(x, y, z1)$  is a delay time period  $T3$  in the case of forming the blank region having length  $y$  after the formation of the first recording mark having length  $x$  and the second recording mark having length  $z2$  and  $T3(x, y, z2)$  is a delay time period  $T3$  in the case of forming the blank region having length  $y$  after the formation of the first recording mark having and a length  $x$  and the second of a blank region to be formed before the formation of the first recording mark having length  $z2$ , where  $z1$  is smaller than  $z2$ .

$$T3(x, y, z1) > T3(x, y, z2)$$

7. (Currently Amended) ~~The A~~The method for recording data in an optical recording medium in accordance with ~~claim 3~~claim 6, wherein a delay time period  ~~$T3$~~  $T1$  between a ~~fall~~rise time of a data pulse corresponding to the first recording mark and a time at which the level of a pulse is switched from the level corresponding to the level of the bottom

~~recording~~ power to the level corresponding to the level of the ~~bottom~~ recording power in the pulse train pattern used for forming the first recording mark is set so as to satisfy a formula below, wherein  $T3-T1(x, y, z1a1, b)$  is a delay time period  $T3$  in the case of forming the ~~blank~~ region having length  $y$  after the formation of the first recording mark having length  $x-b$  and the second recording mark having length of  $z2$  and  $T3(x, y, z2)$  is a delay time period  $T3$  in the case of forming the ~~after formation of a blank region having length  $y-a1$  and  $T1(a2, b)$  is a delay time period in the case of forming after the formation of the first recording mark having length  $x-b$  after formation of a blank region and the second recording mark having length  $z2a2$ , where  $z1$  is smaller longer than  $z2a1$ .~~

$$T3-T1(x, y, z1a1, b) > T3-T1(x, y, z2a2, b)$$

8. (Currently Amended) ~~The A-Themethod~~ for recording data in an optical recording medium in accordance with ~~claim 4~~ claim 6, wherein a delay time period  $T3-T1$  between a ~~fall~~ rise time of a data pulse corresponding to the first recording mark and a time at which the level of a pulse is switched from the level corresponding to the level of the ~~recording~~ bottom power to the level corresponding to the level of the ~~bottom~~ recording power in the pulse train pattern used for forming the first recording mark is set so as to satisfy a formula below, wherein  $T3-T1(x, y, z1a, b1)$  is a delay time period  $T3$  in the case of forming the ~~blank region a recording mark having length  $y-b1$  after the formation of the first recording mark a blank region having length  $x-a$  and  $T1(a, b2)$  the second recording mark having length of  $z2$  and  $T3(x, y, z2)$  is a delay time period  $T3$  in the case of forming the blank region having length  $y$  after the formation of the first a recording mark having length  $x-b2$  longer than  $b1$  after formation of a blank region and the second recording mark having length  $z2a$ , where  $z1$  is smaller than  $z2$ .~~

$$T3-T1(x, y, z1a, b1) > T3-T1(x, y, z2a, b2)$$

9. (Currently Amended) ~~The A~~ method for recording data in an ~~a write-once type optical recording medium in accordance with claim 1~~ including a substrate and at least one recording layer formed on the substrate, the method comprising:

determining a pulse train pattern so that a level of a pulse is switched from a level corresponding to a level of a recording power to a level corresponding to a level of a bottom power in accordance with at least one of a length of a first recording mark, a length of a blank region to be formed immediately after formation of the first recording mark and a length of a second recording mark formed subsequent to the formation of the first recording mark;

modulating a power of a laser beam in accordance with the thus determined pulse train pattern;

projecting the laser beam onto the optical recording medium; and

forming the first recording mark;

wherein in the case of forming the blank region having length  $y$  after the formation of the first recording mark having length  $x$  and the second recording mark having length  $z$ , a value  $T3'(x, y, z : VL)$  obtained by normalizing a delay time period  $T3$  set for forming the first recording mark having length  $x$  and recording data at a linear recording velocity  $VL$  with a channel bit period and a value  $T3'(x, y, z : VH)$  obtained by normalizing a delay time period  $T3$  set for forming the first recording mark having length  $x$  and recording data at a linear recording velocity  $VH$  higher than the linear recording velocity  $VL$  with the channel bit period are set so as to satisfy a following formula.

$$T3'(x, y, z : VL) < T3'(x, y, z : VH)$$

10. (Canceled)

11. (Currently Amended) ~~The apparatus~~ A method for recording data in an  
write-once type optical recording medium in accordance with claim 10  
including a substrate and  
at least one recording layer formed on the substrate, the method comprising:

determining a pulse train pattern so that a level of a pulse is switched from a level corresponding to a level of a recording power to a level corresponding to a level of a bottom power in accordance with at least one of a length of a first recording mark, a length of a blank

region to be formed immediately after formation of the first recording mark and a length of a second recording mark formed subsequent to the formation of the first recording mark;

modulating a power of a laser beam in accordance with the thus determined pulse train pattern;

projecting the laser beam onto the optical recording medium; and

forming the first recording mark;

~~wherein the laser projecting means is constituted so as to project the laser beam whose power is modulated in accordance with a pulse train pattern in which the time at which the level of the pulse of thereof train pattern used for forming the first recording mark is switched from a level corresponding to the level of the bottom power to a level corresponding to the level of the recording power is determined in accordance with at least one of the length of the first recording mark and a length of a blank region to be formed before the formation of the first recording mark and form the first recording mark~~

wherein a delay time period T1 between a rise time of a data pulse corresponding to the first recording mark and a time at which the level of a pulse is switched from the level corresponding to the level of the bottom power to the level corresponding to the level of the recording power in the pulse train pattern used for forming the first recording mark is set so as to satisfy a formula below, wherein T1 (a1, b) is a delay time period in the case of forming the first recording mark having a length b after formation of a blank region having a length a1 and T1 (a2, b) is a delay time period in the case of forming the first recording mark having a length b after formation of a blank region having a length a2 longer than a1.

$$T1(a1, b) > T1(a2, b)$$

12. (Currently Amended) ~~An~~ A method for recording data in an optical recording medium comprising a substrate and at least one recording layer and constituted so that at least two recording marks are formed and data are recorded in the at least one recording layer thereof when it is irradiated with a ~~constituted so as to project a laser beam whose power is modulated in accordance with a pulse train pattern including at least a pulse whose level is set to~~

a level corresponding to a level of a recording power and a pulse whose level is set to a level corresponding to a level of a bottom power; onto a write-once type which optical recording medium is further constituted to be recorded with a program for setting recording conditions necessary for including a substrate and at least one recording layer formed on the substrate and form at least two recording marks in the at least one recording layer, thereby recording data, the method for recording data in an optical recording medium comprising a step of determining the a pulse train pattern so that a level of a pulse is switched from a level corresponding to the level of the recording power to a level corresponding to the level of the bottom power in accordance with at least one of a length of a first recording mark, a length of a blank region to be formed immediately after formation of the first recording mark and a length of a second recording mark formed subsequent to the formation of the first recording mark, modulating a power of laser beam in accordance with the thus determined pulse train pattern, projecting the laser beam onto the at least one recording layer and forming the first recording mark,

wherein the time at which the level of the pulse of the pulse train pattern used for forming the first recording mark is switched from a level corresponding to the level of the bottom power to a level corresponding to the level of the recording power is determined in accordance with at least one of the length of the first recording mark and a length of a blank region to be formed before the formation of the first recording mark and

wherein a delay time period T1 between a rise time of a data pulse corresponding to the first recording mark and a time at which the level of a pulse is switched from the level corresponding to the level of the bottom power to the level corresponding to the level of the recording power in the pulse train pattern used for forming the first recording mark is set so as to satisfy a formula below, wherein T1 (a, b1) is a delay time period in the case of forming a recording mark having a length b1 after formation of a blank region having a length a and T1 (a, b2) is a delay time period in the case of forming a recording mark having a length b2 longer than b1 after formation of a blank region having a length a.

$$T1(a, b1) < T1(a, b2)$$

13. (Currently Amended) ~~The A method for recording data in an optical recording medium in accordance with claim 122, which is constituted to be recorded with a program for setting recording conditions necessary for determining the time at which the level of the pulse of the pulse train pattern used for forming wherein the first recording mark is switched from a level corresponding to the level of the bottom power to a level corresponding to the level of the recording power in accordance with at least one of the length of the first recording mark and a length of a blank region to be formed before the formation of the first the shortest recording mark.~~

14.-17. (Canceled)

18. (New) A method for recording data in an optical recording medium in accordance with claim 3, wherein the first recording mark is the shortest recording mark.

19. (New) A method for recording data in an optical recording medium in accordance with claim 5, wherein the first recording mark is the shortest recording mark.

20. (New) A method for recording data in an optical recording medium in accordance with claim 9, wherein the first recording mark is the shortest recording mark.

21. (New) A method for recording data in an optical recording medium in accordance with claim 11, wherein the first recording mark is the shortest recording mark.

22. (New) A method for recording data in an optical recording medium in accordance with Claim 12, wherein the first recording mark is the shortest recording mark.